REMARKS

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Allowable Subject Matter

Applicants respectfully note the Examiner's indication that dependent claims 14-16 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Applicants appreciate the Examiner's indication of allowable subject matter, but Applicants remain convinced that the broader scope of claims 1, 7, and 13 is patentable.

Claims

Claims 1-20 remain pending in the application with claims 1, 7, and 13 being independent. No claims have been amended, cancelled, or added as part of this response. Reconsideration is respectfully requested.

Claim rejections – 35 U.S.C. §102(b)

Claims 1, 5-7, 11-13, and 17-20 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Application Publication No. 2002/00712906 to Rusch. This rejection is respectfully traversed.

A rejection of any claim under 35 U.S.C. §102 requires that each and every limitation of the rejected claim be found in a single reference. If even a single limitation is not found within the reference, the rejection under §102 is improper and must be withdrawn.

Claims 1 and 7 require a supersonic kinetic spray nozzle including a diverging region with at least a portion of the diverging region having a cross-sectional expansion rate of at least 1.0 millimeters squared per millimeter. Claim 13 requires the step of providing a supersonic kinetic spray nozzle including a diverging region with at least a portion of the diverging region having a cross-sectional expansion rate of at least 1.0 millimeters squared per millimeter. The cross-sectional expansion rate of the portion of the diverging region is dependent upon the length of the portion. Specifically, the cross-

sectional expansion rate of the portion of the diverging region is equal to the change in cross-sectional area of the portion of the diverging region divided by the length of the diverging region. Referring to paragraph [0027], Applicants explained that rapidly expanding the cross-sectional area of a portion of the diverging region leads to a dramatic increase in particle velocity using the same main gas temperature. The rapid expansion of the portion of the diverging region causes a rapid decrease in the gas pressure and a corresponding rapid increase in the gas velocity. The rapid increase in the gas velocity is important in achieving rapid acceleration of the particles. Further, in paragraph [0029], Applicants explain that utilizing nozzles designed according to the present invention results in the increase in the deposition efficiency of particles utilizing the same main gas temperature and pressure relative to prior art nozzles. Specifically, Applicants go on to explain that an expansion rate of at least 1.0 millimeters squared per millimeter provides a significant benefit to the coating performance.

Contrary to the Examiner's assertions, Rusch does not disclose, teach, or otherwise suggest a nozzle including a diverging region with a portion having a cross-sectional expansion rate of at least 1.0 millimeters squared per millimeter. The Examiner cites paragraph [0011], lines 4-8 as disclosing that "at least a 1.0 millimeter squared per millimeter expansion rate is provided with the dimension of the exit end of the divergent portion of the nozzle and the length of the duct 4." To the contrary, paragraph [0011], lines 4-8 *actually* discloses the length and diameter of the elongated duct 4, which is not the same as the divergent region of the nozzle. As disclosed in Figure 1 of Rusch, the elongated duct 4 has a constant cross-section, i.e. the cross-section of the elongated duct 4 does not change along its length. In other words, the elongated duct 4 cannot be the diverging region of the nozzle in Rusch. Accordingly, the length and diameter of the elongated duct 4 does not provide the requisite dimensions for calculating the cross-sectional expansion rate of the diverging region. Further, Rusch does not disclose the length of the diverging region. As stated above, the cross-sectional expansion rate of the portion of the diverging region is dependent upon the length of the portion. As such, Rusch does not disclose a cross-sectional expansion rate of the diverging region of at least 1.0 millimeters squared per millimeter.

In view of the remarks set forth above, it is respectfully submitted that the §102(b) rejection of independent claims 1, 7, and 13 in view of the Rusch is improper and must be withdrawn. Furthermore, the remaining claims, specifically claims 5-6, 11-12, and 17-20, depend from independent claims 1, 7, and 13, respectively, such that the rejection of these claims are also improper and must be withdrawn.

Claim rejections – 35 U.S.C. §102(e)

Claims 1, 5-7, 11-13, and 17-20 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 6,808,817 to Morelli et al. The Examiner states that the rejection may be overcome by a showing under 37 C.F.R. §1.132 that any invention disclosed but not claimed in the Morelli was derived by an inventor of this application and is thus not the invention "by another." As set forth in the enclosed Declaration under 37 C.F.R. §1.132 by inventor Thomas Van Steenkiste, the subject matter of Morelli relied upon by the Examiner to reject claims, 1, 5-7, 11-13, and 17-20 under 35 U.S.C. §102(e) was the work of Thomas Van Steenkiste. Having satisfied the requirements of MPEP 2136.05 and 37 C.F.R. §1.132, the Morelli should be removed as a prior art reference. Accordingly, the rejections based on the Morelli must be withdrawn.

Claims 1-12 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 6,972,138 to Heinrich et al. Accompanying this response is a Declaration under 37 C.F.R. §1.131 by inventor Thomas Van Steenkiste. It has previously been demonstrated by the attached 37 C.F.R. §1.132 declaration that the portions of Morelli relied on by the Examiner was the work of Thomas Van Steenkiste. The 37 C.F.R. §1.131 declaration further demonstrates that Morelli was filed prior to the effective date of Heinrich. Morelli clearly demonstrates that Thomas Van Steenkiste constructively reduced to practice the invention of the present application on the filing date of Morelli. Therefore, Thomas Van Steenkiste reduced to practice the invention of the present application prior to the effective filing date of Heinrich. Having satisfied the requirements of MPEP 2136.05 and 37 C.F.R. §1.131, Heinrich should be removed as a prior art reference. Accordingly, the rejections based on the '138 patent must be withdrawn.

Applicant believes the application is now in condition for allowance, which allowance is respectfully solicited. Applicant believes that no additional fees are required. However, if necessary, the Commissioner is authorized to charge Deposit Account No. 08-2789 for any additional fees or to credit the account for any overpayment.

Respectfully submitted,

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